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**THEORETICAL AND EXPERIMENTAL DISTINCTIONS
BETWEEN PRIVACY AND CROWDING**

W. M. PUGH

J. M. LA ROCCO

REPORT NO. 78-46

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6 Theoretical and Experimental Distinctions

Between Privacy and Crowding

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Privacy and Crowding

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Abstract

After reviewing the definitions and theoretical issues in the areas of privacy and crowding, the conceptual differences between the two constructs were identified. Based upon these differences, crowding was viewed as a response to physical limitations while privacy appeared more directly related to the amount of information one exchanged with others. Using questionnaire responses of 505 U.S. Navy enlisted men, zero-order correlation coefficients were computed to assess the relationship between privacy and indices of information exchange. Partial correlations also were calculated to reevaluate the association after the effects of crowding were removed from the privacy measure. Results of these analyses as well as those reported elsewhere were consistent with the hypothesized distinction between privacy and crowding.

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Theoretical and Experimental Distinctions
Between Privacy and Crowding

Since the development of the ecological approach to behavior (cf. Barker & Gump, 1964), there has been a tremendous growth in the study of the effects of the environment on behavior (cf. Altman, 1975; Proshansky, Ittelson, & Rivlin, 1970). During this period, numerous authors have cited population growth, urbanization, and technological advances as dramatic environmental changes which have potential impact on behavior and therefore should be investigated (Kirmeyer, 1978; Lawrence, 1974; Margulis, 1977a; Schiffenbauer, Brown, Perry, Shulack, & Zanzola, 1977; Schmidt, Goldman, & Feimer, 1976; Stokols, 1972). Pursuant research on the effects of these changes has been conducted under the rubric of crowding, and more recently, privacy. It has often been noted, however, that data reported on the effects of crowding have been inconsistent and inconclusive (Choi, Mirjafari, & Weaver, 1976; Dean, Pugh, & Gunderson, 1975; Heller, Groff, & Solomon, 1977; Kirmeyer, 1978; Lawrence, 1974; Stokols, 1976; Worchel & Teddlie, 1976). Further, at present it is difficult to specify the effects of privacy because of the lack of empirical research on the topic (cf. Altman, 1975; Berscheid, 1977). In an effort to account for apparent discrepancies in existing data and to provide a firmer basis for future research, investigators are currently clarifying and defining the concepts of privacy and crowding.

Crowding Research

A fundamental step in developing the concept of crowding was drawing the distinction between the related notions of density and crowding. Stokols (1972) and others (Choi et al., 1976; Kirmeyer, 1978; Schiffenbauer et al., 1977; Worchel & Teddlie, 1976) have maintained that density refers to the physical limitations of a situation whereas crowding is an experiential state. Theorists differ, however, on the sources of the crowding experience. Stokols' (1972) position that crowding exists "when the individual's demand for space exceeds the available supply of such space" (p. 75) is based upon a behavioral constraint perspective. According to this viewpoint, the experience of crowding reflects a state of psychological stress which is created when one perceives that freedom to perform certain behaviors is limited by the existing situation (Stokols, 1976).

An alternative perspective suggests that the crowding experience is the result of overstimulation. According to Desor, "receiving excessive stimulation from social sources" (Desor, 1972, p. 79) evokes the experience of crowding. Another theory linking overstimulation and crowding was developed by Altman (1975) who viewed privacy as a central construct in which the experience of crowding results when the degree of achieved privacy is less than desired. In Altman's words, "Crowding exists when the privacy-regulation system does not work effectively, causing more social contact to occur than is desired" (Altman, 1975, p. 154).

Privacy Research

Turning our attention to privacy, we find the following among the definitions proposed over the last decade:

Privacy is the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin, 1967, p. 7). [Privacy is the] selective control over access to the self or to one's group (Altman, 1975, p. 18).

After reviewing these and other empirical definitions as well as common and legal meanings of privacy, Margulis (1977b) arrived at the following "shared-core definition" of privacy:

Privacy, as a whole or in part, represents the control of transactions between person(s) and other(s), the ultimate aim of which is to enhance autonomy and/or to minimize vulnerability (Margulis, 1977b, p. 10).

Before accepting the above definition, however, one should be aware of the reservations that Laufer and Wolfe (1977) have expressed about definitions that include the choice/control dimension. They pointed out that in Western society the choice/control dimension is relevant to many other issues and concepts besides privacy. They suggest that instead of viewing choice/control as a defining dimension of privacy, that it be used as a mediating variable.

In order to elaborate on the foregoing definitions of privacy, it may be helpful to briefly review some of the current theoretical perspectives.

First, there is the model (Altman, 1975) in which a boundary is conceptualized as existing between persons or groups and the control of transactions across this boundary determines the degree of privacy one has. When one has total control over the information/stimulation to and from one's self, then one has a high degree of privacy.

In another approach (Laufer and Wolfe, 1977) privacy, like crowding, is considered to be an experiential state. However, using a developmental approach to show how the meaning and experience of privacy is achieved, personal experiences are linked to objective situations and events. The situational elements required to understand the perception of privacy are seen as reflecting three dimensions: the environmental, interpersonal, and self-ego dimensions of privacy.

Crowding and Privacy Compared and Contrasted

Based on the above review of definitions and theoretical positions in the areas of privacy and crowding, the distinction between the two constructs seems apparent comparing some definitions, but is less clear when other combinations are considered. For example, a conceptual difference seems to exist between Stokols' definition of crowding and Altman's definition of privacy. That is, crowding involves one's spatial needs and the opportunities one has in moving into new areas, contrasted with privacy which involves the flow of information and stimulation to and from one's self or domain.

The distinction between Desor's (1972) conception of crowding as excessive social stimulation and Altman's definition of privacy is less clear.

In fact, the correspondence is so close that one might suspect that the treatment effect observed by Desor was due to privacy constraints rather than crowding. Furthermore, this issue is not resolved by examining Desor's experimental design. In Desor's study, model rooms of equal size were used. The rooms differed, however, with regard to shape (square or rectangular), partitioning, and number of doors (two or six). Participants were given small figures to place in the rooms with the instruction to "place as many people as you can here without overcrowding them" (Desor, 1972, p. 80). If more figures were placed in one room than another, Desor concluded that the features characteristic of that room reduced crowding. The results indicated that all three room characteristics affected the number of figures placed in the room. But, it is difficult to determine if the limiting factor reflected the participants perceptions of a) the excessive social stimulation that would occur, b) a perceived discrepancy between the space in the rooms and the space needed for the people represented by the figures, or c) the perceived lack of control over access for the various figures.

Integration and Extrapolation

At the risk of oversimplifying the nature of privacy and crowding, it is suggested that when other people are viewed as objects occupying a place or position the situation will be described in terms of crowding, while in privacy other people are viewed as information senders and receivers. In this regard we note the statement by Margulis:

[We should not] confound control over information (privacy)

with control over interactions (territoriality, personal space,

crowding). These phenomena are related in the world of events but nevertheless are analytically distinct at the conceptual level. (Cited by Klopfer & Rubenstein, 1977, p. 54.)

Thus, "in the world of events," people require both space and opportunities to communicate. However, there are at least two ways in which these aspects of individuals may become conceptually separate. One way involves a process of abstraction. That is, the function of place holding and communication can be separated from the physical person. For example, a purse on a chair can reserve a space or a telephone can allow a distant person to send or receive information.

A second way that these attributes of a person become conceptually distinct is through the unique demands required by different settings; some settings emphasize the territory individuals require, others highlight the role of communication. The notion that settings exercise this type of influence was first developed by Barker and his associates (Barker & Gump, 1964). In their view, groups form a communality of perceptions and expectations about a setting and these perceptions and expectations allow the setting to exercise control over behavior. Laufer and Wolfe (1977) referred to this phenomenon as the "sociophysical element" in their model of privacy. They assumed that properties of some physical settings are more congruent with the experience of privacy than others and that settings consistent with privacy will evoke and support privacy.

In summary, crowding and privacy are concepts which reflect the way one experiences a particular situation. For these to represent two separate

constructs, however, there must be situations that are experienced as private but not crowded and vice versa. Further, different experiences should occur when situations were differentially perceived. Hence, characteristics of a situation could be identified which would allow one to determine if it would be perceived as private or crowded. Specifically, areas where one's physical movement is restricted would be perceived as crowded while areas where communication of information was restricted would be viewed as private.

The model outlined above receives some support from data reported by Pugh, Gunderson, and Dean (Note 1). Their data showed that spatial factors of the environment were more highly related to perceptions of crowding than privacy. The question remains, however, whether environmental properties associated with information transactions are more related to perceptions of privacy than crowding. The purpose of the present paper was to investigate this issue. To accomplish this objective, however, it was necessary to first identify attributes of the environment which were associated with the rate of information exchange. It was felt that the typology developed by Westin (1967) in which four states of privacy were delineated--solitude, intimacy, anonymity, and reserve--could be used for this purpose. In the context of the present theoretical development these states are viewed as four ways that the exchange of information may be restricted. From this perspective then, solitude represents a situation where information about a person is not communicated because no one is present to receive the message. Intimacy is a corresponding situation for groups (i.e., no one is permitted to share the group behavior). Anonymity results when there is

a failure to receive and interpret the information available about a person, and reserve is a failure to send any information. Therefore, correlating measures of these aspects of an environment with perceptions of privacy and crowding would provide a test of the hypothesis that the rate of information exchange is more highly related to privacy than crowding.

Method

Sample

The sample consisted of 505 U.S. Navy enlisted men aboard three amphibious assault ships of the Pacific Fleet; this number represented approximately 75% of the available crew. The mean age was 22.6 years, mean years of formal education prior to naval service was 11.9 years, and average length of service was 3.9 years.

Measures

Near the end of a 7 month overseas deployment, a questionnaire designed to assess characteristics of the physical environment was administered to the crew of each ship. This instrument was a revised version of a survey instrument used in previous assessments of Navy ships (cf. Jones & James, Note 2). Five items drawn from this instrument were summed to create the crowding measure. On two of these items individuals rated living areas aboard their ship on a 5-point scale ranging from "crowded" to "uncrowded," and the other three items were rated on a scale running from "cramped" to "roomy." Thus, a high score on this composite indicated there was a lack of crowding. A similar set of four items rated the amount of available privacy on a 5-point scale of "none" to "plenty." The sum of these ratings comprised an overall privacy score. Finally, 11 items

used to create composites designed to measure the degree to which the ship-board environment supported the four types of privacy--solitude, intimacy, anonymity, and reserve. The items within each of these "environmental sources of privacy" composites are shown in Table 1. Therefore, six separate composite scores were created for each individual which assessed the crowding, overall privacy, solitude, intimacy, anonymity, and reserve.

Insert Table 1 about here.

Analyses

The zero-order correlations among the crowding score (i.e., lack of crowding), the overall privacy rating, and the four composites measuring the environmental sources of privacy were then computed. In addition, the internal consistency (coefficient alpha) of the items within each composite was computed. Finally, in order to be able to evaluate the effects of items which were specific to privacy, part correlations were computed (see McNemar, 1969, Equation 10.37). These correlations reflected either the covariance between each item and overall privacy with the effects of crowding removed (referred to as adjusted privacy) or the covariation between each item and crowding with the effects of overall privacy removed (referred to as adjusted crowding).

Results

The intercorrelations and internal consistency for each of the composites are shown in Table 2 (alpha coefficients shown in main diagonal). The consistency of each composite was judged to be acceptable except for

the anonymity and reserve composites which precluded their use in further analysis. Inspection of the intercorrelations among the composites revealed a strong relationship between solitude and intimacy. This result may be a reflection of the higher reliabilities of these composites. It may also be explained by the conceptual similarity of the two constructs where solitude refers to the separation of an individual from others, while intimacy is the separation of a group from others.

Insert Table 2 about here.

The relationships of the overall ratings of privacy and crowding with measures of the environmental sources of privacy--solitude and intimacy--are shown in Table 3. These data indicated that perceived opportunities for solitude and intimacy were highly related to the perception of privacy. To determine if solitude and intimacy were independently related to the perception of privacy, the multiple correlation of these two composites with privacy was contrasted to the zero-order correlation of solitude and privacy. The difference between these two values was significant [$F(1, 502) = 4.44; p < .05$] indicating that each variable had a unique effect on perceptions of privacy.

In an effort to further clarify the unique attributes of privacy, the effects of crowding were removed from the overall privacy score creating an adjusted privacy score which was uncorrelated with crowding. The results of this procedure are shown in the third column of correlations in Table 3.

Insert Table 3 about here.

These data suggested that the relationship between the items and the overall privacy composite was primarily a function of the variance in the privacy score that was unrelated to crowding. First, when the correlations of the various items with the overall privacy score (shown in column two) are compared to the corresponding values for adjusted privacy (shown in column three), it appeared that removal of the effects of crowding from overall privacy resulted in relatively small decreases in the various correlations. Second, after privacy was adjusted for the effects of crowding, the various items in Table 3 remained more highly correlated with privacy than crowding. Finally, when the effects of privacy were removed from the crowding score and the adjusted crowding score was correlated with the variables in Table 3, each of the resulting correlations were near zero (see column four).

Discussion

These results indicated that privacy and crowding are separate constructs to the degree that they were linked to different aspects of the environment. It was shown that the overall privacy rating varied as a function of environmental assessments that were hypothesized to be sources of the perception of privacy. Specifically, areas which provided greater solitude or intimacy were viewed as being more private. Further, solitude and intimacy were found to have unique contributions to the prediction of the overall privacy rating indicating that there were multiple ways to achieve the experience of privacy. This result suggests that opportunities to be alone and to be able to meet with a specific group to the exclusion of others are, to a degree, separate sources of the privacy experience.

Thus, these data provided some empirical support for Westin's (1967) typology of the state of privacy. However, the internal consistencies for anonymity and reserve indicated that either these two concepts were inadequately measured or that the settings studied did not support those forms of privacy. Some evidence for the latter interpretation was reported by Pastalan (1974) who suggested that anonymity may be impossible to maintain in institutionalized settings.

The proposition that privacy is directly related to the rate of information flow or communication was supported by the finding that the ability to be alone or to have a place to meet with friends without being interrupted was associated with the perception of privacy. However, these attributes of the environment were associated with crowding to a much smaller degree, indicating that they tended to be specific to perceptions of privacy.

To understand how areas aboard ship may be viewed as private, but not necessarily crowded or uncrowded, one might consider the following possibilities. Some individuals may be able to find solitude or meet with their friends in a small space such as an office or storage room. Other crew members may use much larger areas such as cargo holds for the same purposes. Both situations would be described as private but at the same time the attributes of the two spaces could lead to quite different perceptions of crowding.

Although the proposition that crowding is a function of the spatial attributes of a setting could not be evaluated using the data reported in this study, data reported previously by Pugh et al. (Note 1) shed some

light on the issue. These data were obtained from a sample of U.S. Navy enlisted men aboard destroyer-type ships. Crowding and overall privacy scores similar to those reported in the present study were correlated with two composites reflecting spatial constraints aboard the ships. One composite assessed sanitation facilities by using crew ratings of the number of toilets available and the amount of time one had to wait for a shower stall. A second composite combined items that assessed the amount of space available for uniforms and civilian clothes. The former composite correlated with crowding and privacy, $-.40$ and $-.22$, respectively, and the latter composite correlated $.27$ with crowding and $.20$ with privacy. When the effects of privacy were removed from the crowding score, the resulting score correlated with the composites measuring sanitation facilities and space available for uniforms $-.33$ and $.19$, respectively. But, the corresponding correlations with the adjusted privacy score were $-.01$ and $.07$, respectively. Based on these data, it appeared that the spatial limitations aboard ship were more related to perceptions of crowding than to perceptions of privacy.

Figure 1 represents an effort to integrate the theoretical perspective developed earlier with the data presented in the present study as well as previously reported data. The upper portion of the figure corresponds to what Margulis referred to as the "conceptual level" of the privacy and crowding phenomena while the lower portion corresponds to "the world of events." Using the part correlation procedure to remove the effects of crowding from privacy and vice versa, the data supports the notion that

the constructs are "analytically distinct" to the extent that solitude and intimacy correlate with adjusted privacy and spatial constraints correlates with adjusted crowding. However, in "the world of events" privacy and crowding are linked. That is, spatial constraints often represent constraints upon communication or information flow, and therefore it is likely that one's assessments of crowding also will contain indications of the degree of privacy and vice versa. Thus, it is important that in the future when one investigates the effects of crowding, the effects of privacy should be controlled and vice versa. Otherwise, the effect of each construct will become confused with the other; an outcome that is likely to inhibit progress in both fields.

Insert Figure 1 about here.

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Table 1

Item Summaries for the Composites Assessing
Environmental Sources of Privacy

<u>Composite</u>	<u>Item Summary</u>
Solitude	<ul style="list-style-type: none">- It is easy to find a place to be alone- It is easy to find places to go and think things out in private- It is easy to find a place to get peace and quiet
Anonymity	<ul style="list-style-type: none">- Nobody knows what anyone else is doing- It is possible to go unnoticed if you want- It is possible to keep a low profile
Intimacy	<ul style="list-style-type: none">- There are a large number of places where friends can talk in private- A group of friends can meet without being interrupted
Reserve	<ul style="list-style-type: none">- The fact that your personal life is your own business is respected- One can keep personal matters to oneself- There is pressure to discuss personal matters

Privacy and Crowding

Table 2

Composite Intercorrelations and Reliabilities

<u>Composite</u>	<u>C</u>	<u>P</u>	<u>S</u>	<u>A</u>	<u>I</u>	<u>R</u>
Crowding ^b (C)	(.796) ^a					
Privacy (P)	.514	(.699)				
Solitude (S)	.351	.602	(.858)			
Anonymity (A)	.008	.067	.126	(.370)		
Intimacy (I)	.273	.503	.754	.142	(.757)	
Reserve (R)	.130	.211	.250	.229	.252	(.469)

^aAlpha coefficients are shown in the diagonal.

^bScore reversed so that high values indicate a lack of crowding.

Table 3

Correlations of Privacy and Crowding Perceptions with Solitude and Intimacy Measures

<u>Composite</u>	<u>Item Summary</u>	<u>Adjusted</u>	
		<u>Crowding</u>	<u>Privacy</u>
Solitude			
		.351	.602
		.278	.488
		.314	.563
Intimacy			
		.343	.547
		.273	.503
		.255	.494
		.238	.417

^aCorrelations with adjusted privacy (i.e., privacy with the effects of crowding removed) were computed using the formula for a part correlation (McNemar, 1969, Eq. 10.37).

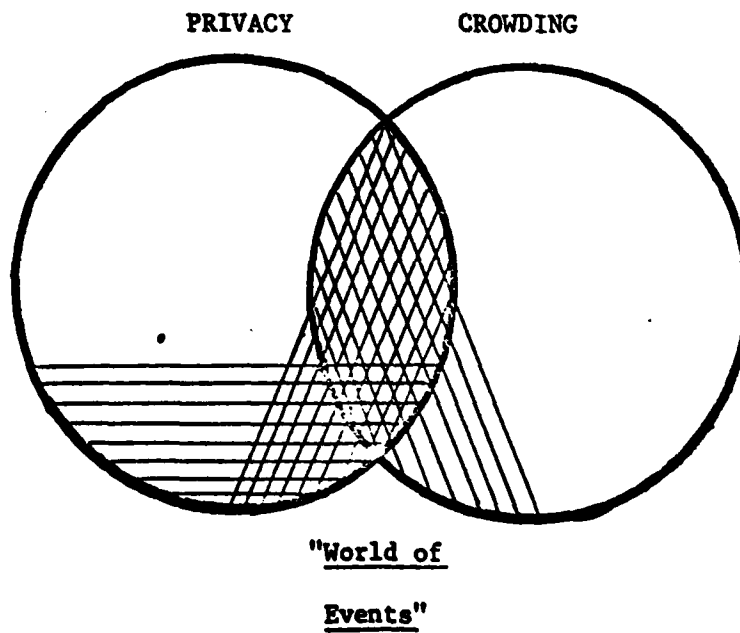
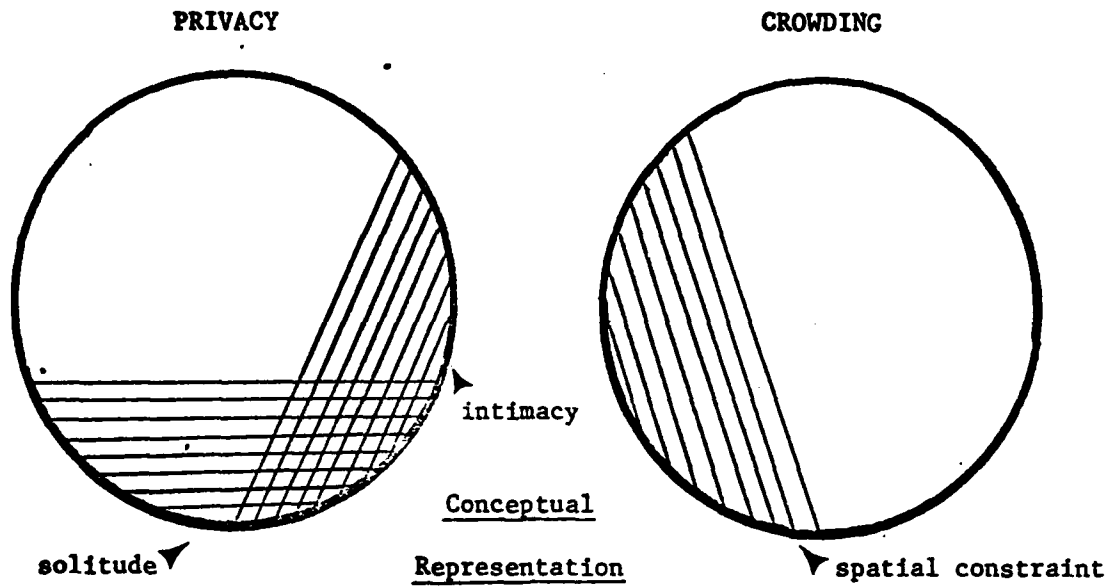


Figure 1. Privacy and crowding conceptually distinct but actually linked.

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